

IN THE CLAIMS

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1. (Currently Amended) A semiconductor dynamic quantity sensor comprising:

- a support substrate having an opening portion open on a surface thereof;
- first and second movable electrode supporting portions fixed to the support substrate;
- a movable electrode supported by the first and second movable electrode supporting portions to be displaced in accordance with a dynamic quantity applied thereto;
- first and second fixed electrode supporting portions fixed to the support substrate; and
- a fixed electrode supported by the first fixed electrode supporting portion at a first end of the fixed electrode and the second fixed electrode supporting portions portion at a second end of the fixed electrode and facing the movable electrode with a detection interval defined therebetween, the detection interval being changed to detect the dynamic quantity when the movable electrode is displaced,

wherein the first and second movable electrode supporting portions are provided on opposed sides of the opening portion; and

the first and second fixed electrode supporting portions are provided on the opposed sides of the opening portion.

2. (Original) The semiconductor dynamic quantity sensor according to claim 1, wherein an axis connecting the first and second movable electrode supporting portions is approximately parallel to an axis connecting the first and second fixed electrode supporting portions.

3. (Original) The semiconductor dynamic quantity sensor according to claim 1, wherein the opening portion is generally rectangular.

4. (Currently Amended) The semiconductor dynamic quantity sensor according to claim 1, wherein:

the movable electrode has a weight portion that is connected to the first and second movable electrode supporting portions at both ends thereof, and has a pole portion protruding from the weight portion;

the fixed electrode has a connecting portion that is connected to the first and second fixed electrode supporting portions at both ends thereof, and has a pole portion protruding ~~from~~ from the connecting portion and having a side face facing a side face of the pole portion of the movable electrode.

5. (Canceled)

6. (Canceled)

7. (Currently Amended) A semiconductor dynamic quantity sensor comprising:
a support substrate having an opening portion open on a surface thereof;
first and second movable electrode supporting portions fixed to the support substrate;
a movable electrode supported by the first and second movable electrode supporting portions to be displaced in a displacement direction in accordance with a dynamic quantity applied thereto;

first and second fixed electrode supporting portions fixed to the support substrate; and
a fixed electrode supported by the first fixed electrode supporting portion at a first end of
the fixed electrode and the second fixed electrode supporting portions portion at a second end of
the fixed electrode and facing the movable electrode with a detection interval defined
therebetween, the detection interval being changed to detect the dynamic quantity when the
movable electrode is displaced,

wherein the first and second movable electrode supporting portions are arranged in a
direction approximately parallel to a direction in which the first and second fixed electrode
supporting portions are arranged.

8. (Original) The semiconductor dynamic quantity sensor according to claim 7, wherein
the direction in which the first and second movable electrode supporting portions and the first
and second fixed electrode supporting portions are respectively arranged is approximately
parallel to the displacement direction of the movable electrode.

9. (Original) The semiconductor dynamic quantity sensor according to claim 7, wherein:
one of the first and second movable electrode supporting portions and one of the first and
second fixed electrode supporting portions are provided on a first side of the opening portion;
and

another one of the first and second movable electrode supporting portions and another
one of the first and second fixed electrode supporting portions are provided on a second side of
the opening portion opposed to the first side.

10. (Original) The semiconductor dynamic quantity sensor according to claim 9, wherein the movable electrode and the fixed electrode respectively have pole portions facing each other with the detection interval defined therebetween, the pole portions extending approximately in parallel with the first side and the second side of the opening portion.

11. (Original) A semiconductor dynamic quantity sensor comprising:

a frame member;

a movable electrode supported by the frame member through a beam portion to be displaced in a displacement direction by a dynamic quantity applied thereto, the movable electrode having a detection surface; and

a fixed electrode supported by the frame member and having a detection surface facing the detection surface of the movable electrode while defining a detection interval that is changed to detect the dynamic quantity when the movable electrode is displaced by the dynamic quantity,

wherein a width of the frame member in the displacement direction of the movable electrode is uniform.

12. (Original) The semiconductor dynamic quantity sensor according to claim 11, wherein the frame member is bonded to a base portion through adhesive having a thermal expansion coefficient different from that of the frame member.

13. (Original) The semiconductor dynamic quantity sensor according to claim 11, wherein the movable electrode is symmetrical with respect to a centerline of the frame member.

14. (Original) The semiconductor dynamic quantity sensor according to claim 11, wherein:

the fixed electrode is composed of a first fixed electrode and a second fixed electrode that are disposed at both sides of the movable electrode and respectively produce a first capacitance and a second capacitance with the movable electrode;

the first capacitance changes in a different direction from that of the second capacitance when the movable electrode is displaced so that a differential capacitance between the first capacitance and the second capacitance is outputted to detect the dynamic quantity; and

a first portion of the frame member supporting the first fixed electrode has a width that is approximately equal to that of a second portion of the frame member supporting the second fixed electrode.

15. (Currently Amended) The semiconductor dynamic quantity sensor according to claim 11, wherein:

the fixed electrode is composed of first and second fixed electrodes that are disposed at both sides of the movable electrode;

each of the first and second fixed electrodes has a supporting portion fixed to the frame member and a comb-shaped electrode portion extending from the supporting portion toward the movable electrode; and

the supporting portion of the first fixed electrode and the supporting portion of the second fixed electrode are point-symmetrical with respect to a center of the frame member.

16. (Original) The semiconductor dynamic quantity sensor according to claim 11, wherein the frame member is square.

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17. (Original) The semiconductor dynamic quantity sensor according to claim 11, wherein the frame member has a first frame part supporting an end of the movable electrode and a second frame part supporting another end of the movable electrode; and

the first frame part has a width in the displacement direction that is approximately equal to that of the second frame part.

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18. (New) A semiconductor dynamic quantity sensor comprising:

a frame member;

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a movable electrode supported by the frame member through a beam portion to be displaced in a displacement direction by a dynamic quantity applied thereto, the movable electrode having a detection surface; and

a fixed electrode supported by the frame member and having a detection surface facing the detection surface of the movable electrode while defining a detection interval that is changed to detect the dynamic quantity when the movable electrode is displaced by the dynamic quantity,

wherein a difference between a first width and a second width of the support substrate is a maximum of 30 μm .

19. (New) A semiconductor dynamic quantity sensor comprising:

a frame member;

a movable electrode supported by the frame member through a beam portion to be displaced in a displacement direction by a dynamic quantity applied thereto, the movable electrode having a detection surface; and

a fixed electrode supported by the frame member and having a detection surface facing the detection surface of the movable electrode while defining a detection interval that is changed to detect the dynamic quantity when the movable electrode is displaced by the dynamic quantity,

wherein a difference between a first width and a second width of the support substrate is 15% or less of a shorter of the first width or the second width.

20. (New) A semiconductor dynamic quantity sensor according to claim 19, wherein a difference between a first width and a second width of the support substrate is 10% or less of a shorter of the first width or the second width.

21. (Re-presented – formerly dependent claim 5) A semiconductor dynamic quantity sensor comprising:

a support substrate having an opening portion open on a surface thereof;
first and second movable electrode supporting portions fixed to the support substrate;
a movable electrode supported by the first and second movable electrode supporting portions to be displaced in accordance with a dynamic quantity applied thereto;
first and second fixed electrode supporting portions fixed to the support substrate; and
a fixed electrode supported by the first and second fixed electrode supporting portions and facing the movable electrode with a detection interval defined therebetween, the detection interval being changed to detect the dynamic quantity when the movable electrode is displaced,

wherein:

the first and second movable electrode supporting portions are provided on opposed sides of the opening portion;

the movable electrode has a weight portion that is connected to the first and second movable electrode supporting portions at both ends thereof, and has a pole portion protruding from the weight portion;

the fixed electrode has a connecting portion that is connected to the first and second fixed electrode supporting portions at both ends thereof, and has a pole portion protruding from the connecting portion and having a side face facing a side face of the pole portion of the movable electrode; and

the connecting portion of the fixed electrode has a bent portion that is bent to extend toward one of the first and second movable electrode supporting portions.

22. (Re-presented – formerly dependent claim 6) A semiconductor dynamic quantity sensor comprising:

a support substrate having an opening portion open on a surface thereof;
first and second movable electrode supporting portions fixed to the support substrate;
a movable electrode supported by the first and second movable electrode supporting portions to be displaced in accordance with a dynamic quantity applied thereto;
first and second fixed electrode supporting portions fixed to the support substrate; and
a fixed electrode supported by the first and second fixed electrode supporting portions and facing the movable electrode with a detection interval defined therebetween, the detection interval being changed to detect the dynamic quantity when the movable electrode is displaced,

wherein:

the first and second movable electrode supporting portions are provided on opposed sides of the opening portion;

the movable electrode has a weight portion that is connected to the first and second movable electrode supporting portions at both ends thereof, and has a pole portion protruding from the weight portion;

the fixed electrode has a connecting portion that is connected to the first and second fixed electrode supporting portions at both ends thereof, and has a pole portion protruding from the connecting portion and having a side face facing a side face of the pole portion of the movable electrode;

the fixed electrode has two pole portions respectively protruding from the connecting portion; and

the connecting portion is widened at a portion connecting the two pole portions.

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